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# Air Resources Board

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TO: George Lew, Chief  
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FROM: Joe Guerrero, Manager  
Engineering Evaluation Section  
Monitoring and Laboratory Division

DATE: July 11, 2006

SUBJECT: UPDATED ORVR PENETRATION CALCULATIONS

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The penetration of vehicles equipped with Onboard Refueling Vapor Recovery (ORVR) control systems was calculated as a percentage of the on-road gasoline vehicles in California in 2006. Data on vehicle miles traveled as of January 1, 2006, was obtained by model year for light duty autos, light duty trucks and medium duty trucks from the Emission Factors (EMFAC) model, version 2.20.

Figure 1 is a comparison of the 2006 calculation of ORVR penetration with the calculations from prior years. Data for Figure 1 is provided in Table 1.

The data and assumptions used in calculating the ORVR penetration for California vehicles are outlined below:

1. The fraction of ORVR vehicles in California's vehicle population by model year was assumed to reflect the federally mandated phase-in schedule. Table 2 is the federally mandated phase-in schedule for ORVR vehicles, which is also listed in the California Code of Regulations (CCR).
2. In 2006 the total vehicle miles traveled (VMT) was calculated for the following gasoline-fueled on-road vehicle categories: light duty autos, light duty trucks (gross vehicle weight rating < 5,750 lbs.), and medium duty trucks (gross vehicle weight rating 5,751 – 8,500 lbs.). Total VMT was determined for each vehicle category by model year from a run of the EMFAC 2.20 model on March 2, 2006. Autos accounted for 61 percent of the total VMT, compared with light duty trucks at 32 percent and medium duty trucks at 7 percent of the total. In prior year calculations, the ORVR phase-in requirements for light duty trucks were applied to the medium duty trucks. In this calculation, the ORVR phase-in requirements for medium duty trucks were applied to medium duty trucks. Although the federal government also

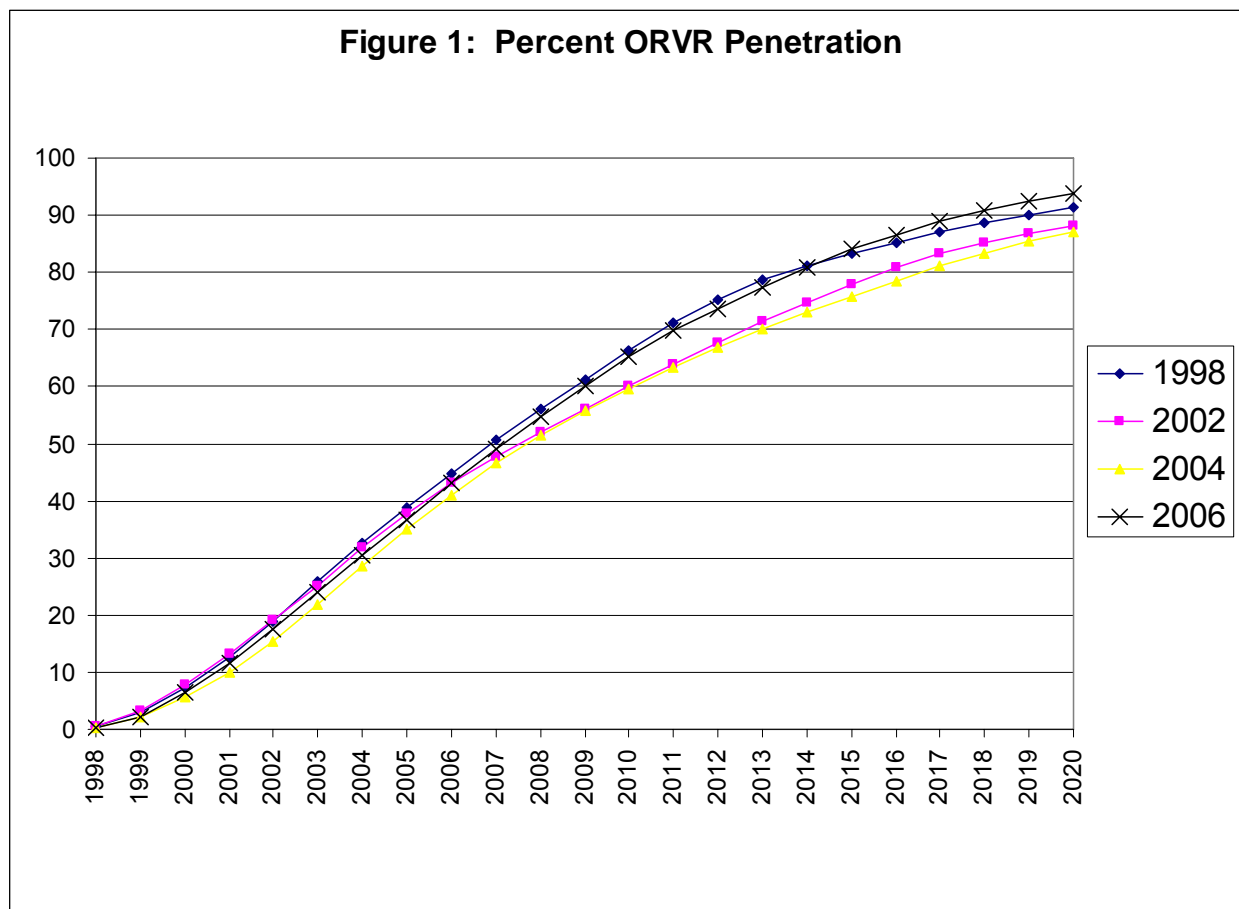
*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

requires ORVR for vehicles in the 8,501 to 10,000 lb. weight range, these heavier vehicles are not included in this analysis.

3. ORVR penetration in 2006 was calculated for each vehicle category and model year by applying the fraction of ORVR penetration by vehicle category and model year in Table 2 to the fraction of the total vehicle miles traveled for each vehicle category and model year on the road in 2006. The profile of vehicle miles traveled for each vehicle category and model year in 2006 was then applied to back cast ORVR penetration for past years and forecast ORVR penetration for future years. This forecasting method does not include any projected changes in buying and driving habits, nor does it include any projected impact of programs to remove older vehicles or encourage use of electric, hybrid, or alternate fuel vehicles.

If you have questions regarding this analysis or need further information, please contact Frances Cameron at [fcameron@arb.ca.gov](mailto:fcameron@arb.ca.gov) or (916) 445-9314.



**Table 1**  
**Estimated ORVR Penetration calculated from vehicle data from 2006,**  
**compared with calculations from 2004, 2002 and 1998**

Vehicle Model Year	ORVR percent calculated in the years listed below*:			
	2006	2004	2002	1998
1998	0.3	0.3	0.5	0.4
1999	2.2	2.2	3.2	3.0
2000	6.6	5.5	7.9	7.3
2001	11.7	9.9	13.3	12.7
2002	17.5	15.5	19.1	19.0
2003	23.9	21.9	25.1	25.9
2004	30.4	28.5	31.8	32.6
2005	36.8	35.0	37.7	38.9
2006	43.0	41.1	43.0	44.9
2007	49.1	46.6	47.8	50.5
2008	54.8	51.5	52.1	56.0
2009	60.2	55.9	56.2	61.3
2010	65.2	59.7	60.1	66.3
2011	69.7	63.3	64.0	71.0
2012	73.7	66.7	67.7	75.3
2013	77.4	70.0	71.3	78.6
2014	80.9	73.0	74.7	81.2
2015	84.0	75.8	77.9	83.4
2016	86.7	78.5	80.8	85.3
2017	89.0	81.0	83.3	87.1
2018	90.9	83.3	85.3	88.7
2019	92.5	85.3	86.9	90.1
2020	93.9	87.0	88.2	91.3
*Estimated percentages as of January 1 of the indicated year.				

**Table 2: Mandated Phase-in Schedule for ORVR Vehicles**

Vehicle Category	Non-ORVR Vehicles	40% ORVR	80% ORVR	100% ORVR
Light Duty Autos	≤ 1997	1998	1999	≥ 2000
Light Duty Trucks (< 5750 lbs.)	≤ 2000	2001	2002	≥ 2003
Medium Duty Trucks (5751 - 8500 lbs)	≤ 2003	2004	2005	≥ 2006

Source: California Code of Regulations (CCR), title 13, section 1978.